

Abstract Submitted
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Enhanced UCN Polarimetry in the UCNA Experiment ERIC DEES, NCSU, UCNA COLLABORATION — The UCNA experiment uses the decay of trapped ultracold neutrons (UCN) to measure the angular correlation A between the emitted electron's momentum and the direction of the neutron's spin. Therefore, a key systematic uncertainty for determination of the A parameter is the average polarization of the decaying UCN. The experiment is designed to couple “in situ” measurements of the equilibrium depolarized fraction to each of the roughly one hour beta-asymmetry data-taking cycles. The recent addition of a neutron reflecting shutter has improved the statistical precision with which the depolarized fraction can be measured, and eliminated the largest systematic correction required for the method used prior to 2011. Previously, this background of residual UCN was a leading source of uncertainty in quantifying the depolarized fraction inside the trap, but by increasing the signal to background ratio, our sensitivity is enhanced by a factor of four from previous years. Methods for maximizing the utility of the shutter, as well as characterizing residual systematics, will be discussed in relation to polarimetry data collected during the 2011/2012 UCNA run cycle.

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